MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 3, 2015 / 2016

PPS 0335 – PROBLEM SOLVING AND PROGRAMMING

(Foundation in Information Technology)

3 JUNE 2016
9.00 a.m. - 11.00 a.m.
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 4 pages (excluding the cover page) with 6 questions only.
2. Attempt **FIVE** out of **SIX** questions. All questions carry equal marks and the distribution of the marks for each question is given.
3. Please write all your answers in the Answer Booklet provided.

Instructions: Attempt **FIVE** out of **SIX** questions. Write your answers in the Answer Booklet.

QUESTION 1 [10 Marks]

a. What is the difference between algorithmic solution and heuristic solution?

(2 marks)

b. Identify each problem as algorithm solution or heuristic solution.
   i. Calculating your expenses you spend in a month.
   ii. Finding a friend's house without a house address.
   iii. Searching for a file on computer's hard drive.
   iv. Repairing a punctured bike tire.

(2 marks)

c. What is the result of the following operations?
   i. True OR True AND False
   ii. NOT True OR True
   iii. False AND (True OR NOT True)
   iv. 250 MOD 4 * 5
   v. 'H' < 'B'
   vi. 3.3 + 2.2 – 1.5 * 2
   vii. 4.5/2.0
   viii. 55 > 55

(4 marks)

d. Briefly explain the difference between internal documentation and external documentation.

(2 marks)

QUESTION 2 [10 Marks]

a. 100 employees of a certain firm are entitled to get bonuses and they are grouped into two types which are permanent and contract. The total number of employees in each group is unknown. However, the chart below shows the amount of bonus paid to each employee based on group type. The management of the firm wants to know the total bonuses paid to each group. Develop an algorithm to find the total bonuses paid to each group. Use the following requirements in your algorithm:
   i. Use the code 'P' and 'C' to represent the group
   ii. Use straight through logic decision
   iii. Use repeat … until loop

Employee Group	(P)ermanent	(C)ontract
Bonus paid to an employee (RM)	200	100

(8 marks)

Continued...

b. Set up a logical expression in a decision statement for the following conditions:
   i. The average must be from 20 to 25 inclusive for the result of the test to be passed.
   ii. The sum of the integers cannot exceed 200 for the sum to be printed.

(2 marks)

QUESTION 3 [10 Marks]

a. An object travels at 5 feet per minute. Develop a flowchart to find how many feet it travels given the time in hour (assuming no negative input). Use while loop to solve the problem.

Sample output:
Enter hour: 1
Total feet travel:300

(7 marks)

b. Name the data type for each of the following items.
   i. The price of an item: 7.50, 2.65
   ii. A gender check: Male or Female
   iii. A date: "11/3/2009"
   iv. An option: 'Y' or 'N'
   v. The number of students: 3000
   vi. The temperature: - 4

(3 marks)

QUESTION 4 [10 Marks]

a. Set up a computer equation to calculate the following problems. Use the recommended variables (in bold) and other suitable variables.
   i. The distance from town A to town B is x miles. The distance from town B to town C is doubled as A to B. Find the distance from A to C.
   ii. Find the amount 40% of value y.
   iii. A rectangle has a perimeter 14. The longer side has length equal to k. What would be the length of the shorter side?
   iv. Johan takes 20 minutes to jog around the race course one time, and 25 minutes to jog around a second time. What is his average speed in miles per hour for the whole jog if the race course is d miles long?

(4 marks)

Continued...

b. Two equal circles (see **Figure1**), with radius ***r***, are cut out of a rectangle card of dimensions ***lengthX*** and ***heightY***. The circles have the maximum diameter possible. Develop a PAC chart (example shown below) to find the approximate area of the paper remaining after the circles have been cut out.

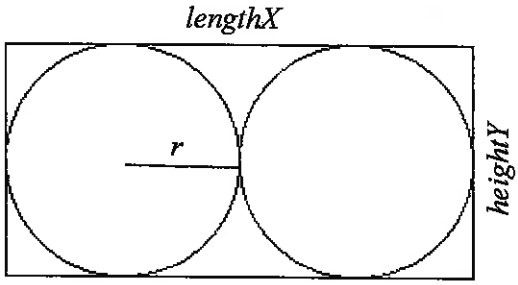

Figure 1: Two equal circles

PAC chart

Given Data	Required Result
Processing Required	Solution Alternatives

(6 marks)

QUESTION 5 [10 Marks]

a. The table below shows the wages paid to the professional workers in a country. The wages are paid based on USD per hour. Develop **TWO (2)** pseudocodes to determine the type of professional area based on the wages given. The first pseudocode uses positive logic and the second pseudocode uses negative logic. Develop only the *if/then/else* part.

Wages USD per hour	**Professional areas**
30 – 40	administration and office support
41 – 60	architecture and design
61 – 80	consulting and training
81 - 100	accounting and engineering

(8 marks)

b. Statements below are rules for naming variables in programming. Identify each statement as True OR False.
   i. Must begin with a letter
   ii. The special characters such as ($ # * , ; :) are valid characters.
   iii. Can be a reserved word.
   iv. Can use upper and lower case.

(2 marks)

Continued...

QUESTION 6 [10 Marks]

a. In a class of 80 students only 60% passed the subject. Of the students passing the subject, only 21% earned grade A. Develop an IPO chart (example shown below) to find the number of students who failed the subject and passed the subject but did not earn grade A.

IPO chart

Input	Processing	Module Reference	Output

(6 marks)

b. Based on question 6(a), write a proper computer equation to find the following output:
   i. How many students passed the subject?
   ii. How many students failed the subject?
   iii. How many students earned grade A?
   iv. How many students passed but did not earn grade A?

(4 marks)

End of Paper